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## Dam Information

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### Albeni Falls Dam



The dam was built at the site of a natural falls called Albeni Falls, named after an early settler, Albeni Poirier. Albeni Falls Dam was authorized for construction under the Flood Control Act of 1950. This Act was signed by the United States Congress in response to a great flood that swept over the river valleys of the Columbia basin in 1948. Albeni Falls Dam was built from January 1951 to December of 1955 at a total cost of 34 million dollars. Today, it produces over 200 million kilowatt hours of electrical energy each year. When running at top capacity, the three Kaplan generators can generate 42.6 megawatts. That's enough power to supply about 15,000 homes. Bonneville Power Administration (BPA) markets this electricity to customers primarily in the Pacific Northwest. This power production saves the United States from buying about 4.9 million barrels of imported oil each year. Albeni Falls Dam has a unique feature that no other dam has--a log chute. During the 1940's, there was a lot of logging activity in Idaho. Logs were trucked to or

Logging activity in earlier days were critical to the floated down the Pend Oreille River to the sawmills. When the dam was built, a log chute was included in the design to enable the logs to pass through. Albeni Falls Dam is made up of two different parts: the powerhouse and the spillway. The powerhouse contains powerful turbines and generators that convert gravity-driven river water into hydroelectricity. The spillway can either store water for downstream power production and irrigation at other dams along the Pend Oreille and Columbia Rivers, or release water for upstream flood control. There is 136,000 cubic yards (61 million pounds) of concrete in the structure.

#### The Powerhouse



Inside the powerhouse there are three mighty turbines changing the power of moving water into hydroelectricity. Water backed up behind the dam creates head. Head is the difference in feet of the water level above and below the dam. Albeni Falls Dam needs a minimum of an 8-foot head to produce electricity. Normally the dam operates with about a 20 foot head. Water enters the powerhouse through the open intake gates, is swirled around in the scroll case, passes through the wicket gates, and falls upon blades of the turbine. This causes the turbine to spin like wind through a wind mill. The turbine is attached to a long,

stainless steel shaft which connects it to the rotor. The rotor is made up of alternate north and south poles of electromagnets. As the rotor spins, it passes by the stator. The stator, or stationary part of the generator, is a tightly wound copper coil. The magnetic field passing through these stator windings excites the electrons in the copper, creating electrical current. All three generators running at top capacity produce 42.6 megawatts, each one producing 14,200 kilowatts at 19,600 horsepower. The hydroelectric generation process was discovered in 1831 by British experimental scientist Michael Faraday.

#### The Spillway



Albeni Falls Dam wasn't designed for water to flow over the spillway, but to flow under a series of 10 gates that are lifted and lowered by the gantry crane on top of the spillway. In this photo, you see all of the gates in the full open position. In times of high flood danger, all 10 gates are opened and the spillway is in the free-flow condition. In this configuration the spillway can release a maximum of 350,000 cubic feet per second of water. During free flow, as it's called, electricity cannot be produced due to only a 4-foot head (refer back to The Powerhouse section for an explanation about the term head). Flood control continues through spring when snowmelt is coming down off the mountains. In summer, the spillway gates are closed to bring Lake Pend Oreille up to the normal summer range of 2,062.0 to 2,062.5 feet above sea level for recreational and ecological purposes. The entire length of the spillway is 472 feet (143.9 meters).

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